

CLAIMS

1. Portable electronic device (10) arranged to be communicating with a reference frequency generator (12) and comprising:
 - 5 a receiving unit (20) receiving a reference frequency,
 - a frequency source (22) generating a frequency of the device, and
 - at least one control unit (24, 30; 24) arranged to:
 - In case of contact with the reference frequency generator:
 - 10 supply a new control value to the frequency source, said value being determined by the frequency source frequency and the reference frequency, and
 - calculate a rate of change value at least based on the new and a previous control value,
 - In case of no contact with the reference generator:
 - 15 calculate a new control value based on the rate of change value and the last used control value, and
 - supply the new control value to the frequency source for controlling it.
- 20 2. Portable electronic device according to claim 1, further comprising a detecting unit (32) detecting if the device is in contact with the reference frequency generator or if contact is lost.
- 25 3. Portable electronic device according to claim 1 or 2, further comprising a control value store (26) at least including the last used control value and a change of rate store (28) at least including the rate of change associated with the last used control value.
- 30 4. Portable electronic device according to any previous claim, wherein there is a first control unit (24) arranged to control the frequency source in case of contact with the reference frequency generator and a second control unit (30) arranged to control the frequency source in case of no contact with the reference frequency generator.
- 35 5. Portable electronic device according to claim 4, further comprising a switch (34) arranged to connect the first control unit (24) with the frequency source in case the detecting unit detects connection and to connect the second control unit (30) with the frequency source in case it does not.

- 5 6. Portable electronic device according to any previous claim, further including a timer (35) starting in case contact is lost with the reference frequency generator, wherein the control unit (30) controlling the frequency source in case of no contact with the reference frequency generator (22) is arranged to stop using the rate of change information if the counter reaches a predetermined value.
- 10 7. Portable electronic device according to claim 6, wherein the timer (35) is reset if contact with the reference frequency generator is established after being lost.
8. Portable electronic device according to claim 6 or 7, wherein the predetermined value is dependent on the rate of change information.
- 15 9. Portable electronic device according to claim 8, wherein the predetermined value is high if the rate of change is low and is low if the rate of change is high.
10. Portable electronic device according to any previous claim, wherein it is a mobile phone and the reference frequency generator is a base station.
- 20 11. Control device (24, 26, 28, 30, 32, 34, 35; 24, 26, 28, 32) for a frequency source (22) using an external reference frequency generator (12), arranged to:
- In case of contact with the reference frequency generator (22):
- supply a new control value to the frequency source, said value being determined by the frequency source frequency and the reference frequency, and
- 25 style="padding-left: 80px;">calculate a rate of change value at least based on the new and a previous control value,
- In case of no contact with the reference generator:
- calculate a new control value based on the rate of change value and the last used control value, and
- 30 style="padding-left: 80px;">supply the new control value to the frequency source for controlling it.
- 35 12. Method of regulating an frequency source in a portable electronic device, comprising the steps of:
- In case of reception of a reference frequency from an external reference frequency generator, (step 38):

supplying a new control value to the frequency source, (step 42)
said value being determined by the frequency source frequency and
the reference frequency, (step 40), and
calculating a rate of change value at least based on the new and a
previous control value, (step 44),

In case of no reception of reference frequency signals from the external
reference frequency generator, (step 38):

calculating a new control value based on the rate of changed value and the
last used control value, (step 48), and

supplying the new control value to the frequency source for controlling it,
(step 52).

13. Method according to claim 12, further comprising the step of detecting
reception or no reception of reference frequency signals.

14. Method according to claim 12 or 13, further comprising the step of storing the
supplied control value, (steps 46, 52) and in case of reception of reference
frequency signals from the external reference frequency generator also the rate
of change value (step 46).

15. Method according to any of claims 12 - 14, further including the steps of: in
case of no reception of reference frequency signals from the external reference
frequency generator: counting the time during which no reference frequency
signals are received, and stopping calculating new control values if the time
reaches a preset time limit.

16. Method according to claim 15, further including the step of resetting the time if
reference frequency signals are received again.

17. Method according to claim 15 or 16, wherein the predetermined value is
dependent on the rate of change value.

18. Method according to claim 17, wherein the predetermined value is high if the
rate of change value is low and is low if the rate of change value is high.